

## PATENT SPECIFICATION



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## COMPLETE SPECIFICATION

## Improvements in Hydraulic Motors

I, CHARLES HYLAND, a British subject, of 18, York Street, Wakefield, in the County of York, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to hydraulic motors of the type comprising a relatively rotatable cylinder block and a co-axial distribution valve, said cylinder block affording a plurality of radial cylinders fitted with pistons which operate on one or more "elliptical" or other cam tracks rotatable relatively to the cylinder block.

In this type of rotary hydraulic motor the distribution valve and the cam track or tracks have been fixed, and the cylinder block with its radially operating pistons has been rotated directly upon the said distribution valve, ports in the inner ends of the cylinders and in communication with the working spaces at the inner ends thereof being brought in turn into register with pressure and exhaust passages in the distribution valve. With this known construction the stroke of the pistons is constant and each piston makes two strokes per revolution with a view to securing a complete balance of the working parts and obviating shock in the system, but it is found in practice that the distribution valve is subjected to heavy loads and wear which result in leakages between the said valve and the cylinder block and consequent loss in efficiency.

According to the invention the cylinder block is provided or formed with a laterally projecting central boss formed with passages or ports communicating directly one with each of the working spaces at the inner ends of the cylinders, and the outer ends of said passages or ports co-operate with ports in a floating distribution valve rotatable relatively to and mounted directly upon said laterally projecting boss. In this way the load of the cylinder block is removed from the distribution valve and thereby wear is considerably reduced and leakages obviated or very materially minimised.

In order that the invention may be

[Price 1/-]

clearly understood and readily carried into effect, the same will now be more fully described with reference to and by the aid of the embodiment illustrated in the accompanying drawings, wherein:—

Figure 1 is a sectional view of a hydraulic motor having a floating distribution valve in accordance with the invention.

Figures 2 and 3 are respectively an elevation and a section of the floating valve showing the arrangement of ports or passages therein.

Referring to Figure 1 of the drawings, the hydraulic motor comprises a rotary cylinder block 1 affording a plurality of radial cylinders 2 each of which is fitted with a piston 3 which are operated or controlled by means of rollers or runners 4 mounted on spigots or trunnions 5 on each piston 3 engaging stationary elliptical or approximately elliptical cam tracks 6 within which the cylinder block 1 rotates. The cylinder block 1 is fixed to a shaft 7 whereby it is mounted in side bearings 8 in the enclosing motor casing 9, and the elliptical or approximately elliptical cam tracks 6 are located one at each side of the rotor 1, whilst the pistons 3 may be urged outwardly from the heads or inner ends of their cylinders 2 by compression springs 10. The centre of the rotor 1 is formed with a laterally projecting boss 11 which is drilled with bores or passages 12 parallel with the axis of the rotation, there being a separate bore or passage 12 leading into each cylinder, whilst the outer ends of these bores or passages 12 are sealed by plugs 13, and two radial ports 14, one for pressure and one for exhaust, are formed in the laterally extending boss 11 into each of said axially arranged bores or passages 12. A floating distribution valve 15 in the form of a block having diametrically opposed pressure and exhaust ports 16<sup>a</sup>, 16, respectively, (see Figures 2 and 3) is mounted upon and closely fits the laterally extending boss 11, so that the ports 16, 16<sup>a</sup> co-operate with the radial ports 14 in turn, said floating valve 15 being conveniently held against rotation by means of a radius arm 17 secured thereto and

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radially slotted at its outer end to slidably engage a pin 18 in the casing 9. In this way the floating valve 15 is free to partake of all the movements of the laterally extending boss other than its rotary motion. Thus said sleeve or valve can move axially with or upon said extension or it can oscillate or move laterally as a result of any slight eccentricity of the extension, thereby ensuring a free or floating action without loading and resultant wear upon the valve. Moreover, the diametrically opposed arrangement of pressure and exhaust ports 16<sup>a</sup>, 16 ensures a balancing of the stresses set up by the fluid pressures.

The pressure ports 16<sup>a</sup> of the sleeve or valve 15 are fitted with coiled or flexible inlet pipes 19, whilst the rollers or runners 4 associated with each piston 3 are fitted with ball or roller bearings 20, and the rotor 1 may also be mounted in ball or roller bearings.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. Hydraulic motors of the type specified, wherein the cylinder block is provided or formed with a laterally projecting central boss formed with passages or ports communicating directly one with each of the working spaces at the inner ends of the cylinders, and in which the outer ends of said passages or ports co-operate with ports in a floating distribution valve rotatable relatively to

and mounted directly upon said laterally projecting boss.

2. Hydraulic motors according to claim 1, wherein the rotor has an axially projecting boss formed with axial passages communicating one with each cylinder at one end and with radial pressure and exhaust ports co-operating with the pressure and exhaust ports of the distribution valve mounted upon said axially projecting boss.

3. Hydraulic motors according to claim 2, wherein the floating distribution valve is free to partake of all the movements of the laterally projecting boss other than its rotary motion.

4. Hydraulic motors according to claim 3, wherein the floating distribution valve is held against rotation by means of a radius arm.

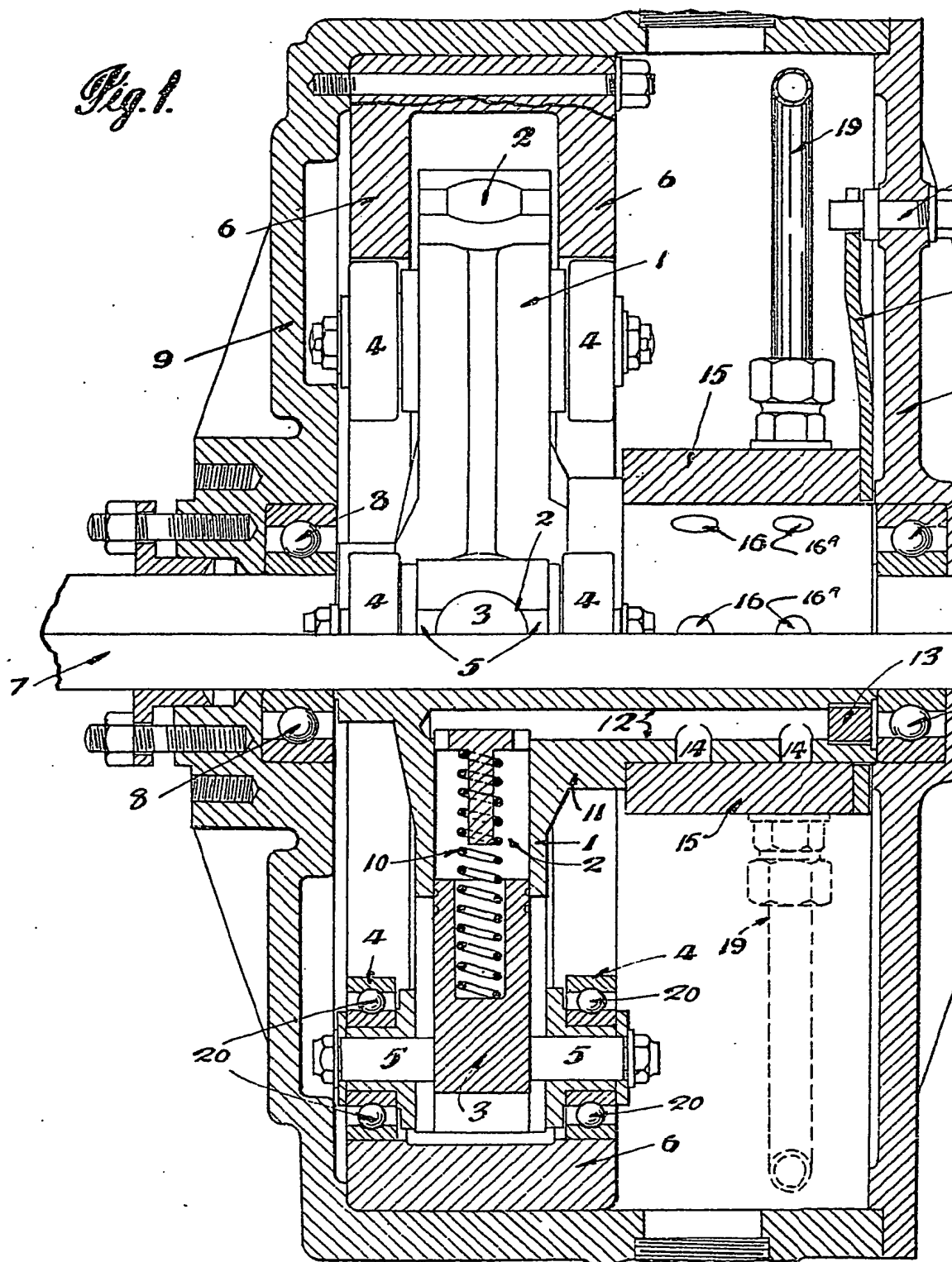
5. Hydraulic motors according to any of the preceding claims, wherein the pressure ports and also the exhaust ports in the floating distribution valve are diametrically opposed so as to balance the stresses set up by fluid pressures.

6. Hydraulic motors, constructed arranged and adapted to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

Dated this 17th day of September, 1935.

CHARLES HYLAND,  
per John E. Walsh & Co.,  
7, East Parade, Leeds 1;  
and at Halifax.  
Agents for Applicant.

*Fig. 1.*



[This Drawing is a reproduction of the Original on a reduced scale.]

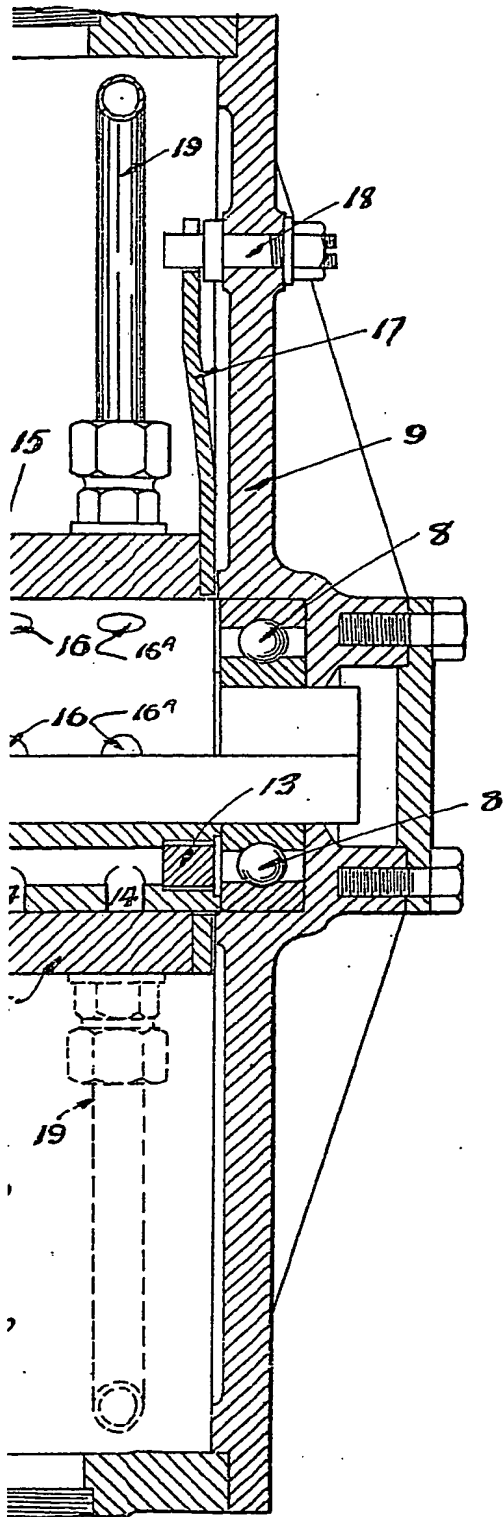


Fig. 3

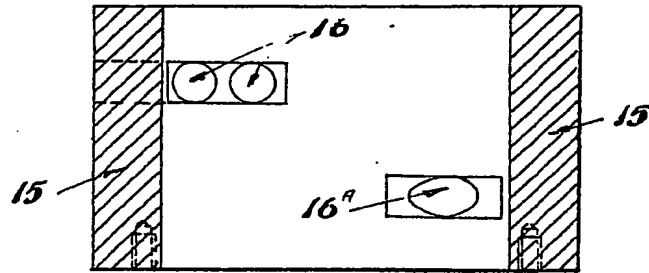


Fig. 2.

